

In the Specification:

Please substitute the following paragraphs for the corresponding paragraphs beginning at the indicated location in the specification as originally filed.

Page 10, line 20+:

These qualities are developed through the provision of two key features of the invention in accordance with its basic principles thereof as will now be described with reference to sector 16b of Figure 1 as detailed in Figure 2. First, a universal time base 110 is provided at each directional coupler 14₁ and at the central facility which will be used in several ways that will be described below. Second, a relatively low frequency carrier signal can be easily and economically derived from a low cost crystal oscillator and a divider chain which will not interfere with other upstream or downstream communications. The invention thus preferably employs a 25 KHz carrier which can be derived from a crystal oscillator (such as is readily commercially available and a divide-by-100 circuit which is also commercially available at low cost).

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Specifically, it is preferred to use a frequency-based coding system similar or identical to that used for "touch-tone" telephone dialling. This arrangement utilizes only seven frequencies in pairs to cover ten or twelve discrete characters (e.g. numerals 0 to 9, * and #). These frequency pairs are easily generated with a keyboard which can be emulated with a cross-bar switch that can be field programmed. Memories such as EEPROMS or other arrangements such as automatic dialers now readily available in many telephone sets can also be used to generate tone pairs or sequences thereof. Automatic dialers generally are arranged or can be

controlled to transmit five to ten or more tone pairs per second. A sequence of tone pairs may be easily and reliably decoded by a commercially available fast Fourier transform integrated circuit which is also ubiquitous in telecommunications and other technologies which utilize data transmitted as tones from telephone keypads.

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Time slots are defined independently but synchronously at the central station 22 and at the directional couplers by a universal time base at each location. These universal time bases are readily available commercially at low cost and are synchronized by radio transmissions from the National Bureau of Standards which is received over a small antenna. A suitable time base unit (which is preferably battery powered) is marketed under the name of "The Time Machine" by Oregon Scientific, 19861 S. W. 55th Place, Tualatin, Oregon. ~~individual~~ Individual time slots may be identified by simply counting the one-second intervals derived from this unit. It should be appreciated that such counting to identify a time slot corresponding to a particular cable drop need only be performed at the directional coupler or, less desirably, the cable drop.

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Thus, in summary, when a monitored condition is detected at a cable drop, a signal is sent from the cable drop to the directional coupler to which it is connected. The time base and counter at the directional coupler 14 identifies a time slot associated with the cable drop and, if a signal has been received therefrom when the time slot of the cable drop is reached, a tone or tone pair sequence generated, for example, in the same manner as an

automatic dialer is sent from the directional coupler upstream to the central facility 22. The tone or tone pair sequence received by the central facility is decoded (e.g. in the manner of telephone keypad data) and recorded with a simple and inexpensive printer for appropriate action to be taken.

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Use of such a transition (e.g. rollover or carry) of the MSB is also convenient for changing the polling frequency at controller 25. For example, the polling frequency transmitter could be used to simply select the counter bit which will be treated as most significant and reset all counters accordingly while transmitting a pulse or tone burst downstream to alter comparator function correspondingly at the directional couplers 14' or, more generally, 40.

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When a signal is emitted at any time, however, it is detected and latched at 44 to await a time slot for transmission. A unique address or identification number for each cable drop is stored in comparators 45 while time slot ~~number~~ numbers are generated by counter 24'. The addresses and identification numbers may be field programmed at installation in a manner identical, in the preferred implementation of the invention, to the setting of a speed dialer or a redial mechanism of an ordinary telephone having either facility. When a correct comparison is made, the comparator provides an output to a circuit such as a speed dialing or redialing circuit 46 which outputs a sequence of tones or tone pairs. (If more than a single condition is to be reported, one or more additional tones or tone pairs may be output to indicate a plurality of conditions of a combination thereof. To do so, the latches, comparators and dialers can be replicated for

each cable drop or combinations of latches for each cable drop could be encoded or the like.)